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EXAMINER

DINH, TUAN T

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 07/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/786,787

Applicant(s)

COTTON, MARTIN A.

Examiner

Tuan T Dinh

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 and 26 is/are allowed.
- 6) ☒ Claim(s) 1-23, 27 and 28 is/are rejected.
- 7) ☒ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 4/2/02 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Specification*

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.
2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification does not support the limitation "the trench having a length greater than two times a breath of the trench", as recited in claim 2, line 11-12.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification is silent regarding "said trench having a length greater than two times a breath of said trench" claim 2, lines 11-12.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claim 1-4, 8-23, and 27-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Kiani et al (U. S. Patent 6,388,208).

As to claim 1, Kiani a wiring connection structure for printed circuit board (10, column 6, lines 58-59) for interconnecting wiring circuit traces (14a-14c, column 7, line 1) on a plurality of circuit trace layers (12a-12h, column 6, line 60) applied on a plurality of printed circuit board layers (10) and electrically isolated there between by the printed circuit board layers and having a printed circuit board multi-layer structure (column 7, lines 15-34) as shown in figures 1-23, characterized by:

a through hole (MCVs-16, column 7, line 18) with a convoluted shaped (column 6, lines 51-56) having an interior wall (18a-18b, 20a-20b) that vertically extends through and intersects and exposes a plurality of wire circuit traces (14) and having a plating of conductive material applied to the interior wall electrically connecting a plurality of wire exposed circuit traces on a plurality of circuit layers (column 7, lines 47-67).

As best understood to claims 2, 21-23, Kiani discloses an EMI shielding structure as shown in figures 1-23 for a printed circuit board (10) for shielding wiring circuit traces (14) on a plurality of circuit trace layers (12) applied on a plurality of printed circuit board

layers and electrically isolated there between by the printed circuit board layers and having a printed circuit board multi layer structure, characterized by:

a trench (26-figurew 1A) having a rim (pads 28a-28b, column 9, line 60) about an opening of the trench at a top printed circuit board layer and said trench (26) extending through a plurality of printed circuit board layers (10) to a grounding plane (26b) exposing said grounding plane and said trench having an interior wall with a conductive plating material applied over said wall and said trench having a length greater than two times a breadth of said trench and said wall vertically extends around the perimeter of the printed circuit board and said plating electrically connects to said exposed ground plane and wraps over and laterally extends from said rim forming a lip.

As to claims 3-4, 8, 13, and 16, Kiani discloses a wiring connection structure and a method as shown in figures 1-23 for a printed circuit board (10) for interconnecting a plurality of wiring traces (14) applied on a plurality of printed circuit board layers (12) and electrically isolated by printed circuit board layers and having a printed circuit board first layer with a main surface, characterized by:

a first wire trace (14a) applied to said main surface having a first terminal landing pad with a first through hole (an opening of pad 19) there through, said first through-hole having a convoluted shaped cross section with a continuous perimeter (see figure 1D);

a printed circuit board first insulation layer (29-figure 1A, column 9, line 59) formed over said first wire trace (14a) having a second through hole (20a which is a wall of a via hole) of identical cross sectional geometry to and vertically aligned with the first

through hole and extending to the first terminal landing pad (14a) exposing a portion of said first landing pad; and

a second wire trace (14c) applied to the printed circuit board first insulation layer having a second terminal landing pad with a third through hole (21-figure 1) having identical geometry to and vertically aligned with the first and second through holes,

wherein said first, second and third through holes (formed by MCV 16 or 26) are adjoining and are plated there through with an electrically conductive material forming a plated through hole with a convoluted cross section that vertically intersects the first and second terminal pads and electrically connects the first wire trace and the second wire trace by a connection between the first and second wire trace terminal landing pads and the plated through hole.

As to claim 14, Kiani discloses the structure as shown in figures 1-23 wherein the major diameter is at least about twice that of the minor diameter.

As to claim 15, Kiani discloses the structure as shown in figures 1-23 wherein the major diameter is at least about three times that of the minor diameter.

As to claim 27, Kiani discloses the structure as shown in figures 1-23 wherein said convoluted shaped cross section is square (column 6, lines 51-56).

As to claims 17-19 and 28, since the method of manufacturing the device is merely a list of steps of forming, these steps must be performed in order to obtain the device (see rejection of claims 3-4, 8, and 13-16 above). Therefore, the method of manufacturing would be inherent to the shown structure of the device.

As to claim 9-12, Kiani discloses a reference plane structure as shown in figures 1-23 for fixing a potential reference for a plurality of circuit trace layers (12) that are electrically isolated there between by the printed circuit board layers (10) and having a printed circuit board first layer (12'-figure 1A), characterized by:

- a first wire trace circuit layer (14a) applied to said main surface;

- a first printed circuit board insulating layer (29a of dielectric layer 29) formed over said first wire trace circuit layer;

- a first reference plane (pad 19) applied over the first printed circuit board insulating layer;

- a trench (26-figure 1A) having a rim (pads 28a-28b, column 9, line 60) having an interior wall and extending about a perimeter encompassing the first wire trace circuit layer and extending through the printed circuit board first layer, extending through and exposing the first wire trace circuit layer; extending through the first insulation layer and extending to the reference plane exposing the reference plane; and

- a conducting plating layer on the interior wall (20a) electrically connecting the first wire traces layer to the ground plane; wherein the perimeter encompasses a portion of the first trace circuit layer (14).

As to claim 20, since the method of manufacturing the device is merely a list of steps of forming, these steps must be performed in order to obtain the device (see rejection of claims 2, 9-12 above). Therefore, the method of manufacturing would be inherent to the shown structure of the device.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiani in view of Mattei (US 5,522,132).

Kiani discloses all claimed subject matter except for the continuous curved cross section is "U" shaped.

Mattei discloses in Fig. 5 the continuous curved cross section "U" shaped. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the through hole having U shaped, as taught by Mattei to employ the structure of Kiani, in order to reduce insertion loss and return loss and to improve isolation.

As to claims 6-7, Kiani and Mattei disclose(s) the claimed subject matter except for the through hole having the "L" shaped/ "+" shaped. It would have been obvious matter of design choice to "L" shaped, "+" shaped, since applicant has not disclose the "U" shaped, "L" shaped, "+" shaped solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with convoluted shaped i.e. "U" shaped.



***Allowable Subject Matter***

8. Claim24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 25-26 are allowed.

10. The following is an examiner's statement of reasons for allowance:

Neither the references cited nor the cited references do not teach or suggest the EMI shielding structure comprising an EMC sensitive track extending through a partial outer shield defined by a trench interior wall, a plating lip, and grounding plane.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

11. Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

**TD**  
July 1, 2002

  
**KAMAND CUNEO**  
**PRIMARY EXAMINER**